

CATHY WALKER 2-23-82

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RECORDED

RESIDUES OF LINDEME IN FAT AFTER DERMAL APPLICATION

The use of Moxidectin-containing drugs directly on to the domesticated animals to control ectoparasites may result in deposition of the insecticide in the body fat. In cattle, Chitwood has shown that 0.02% lindane applied dorsally results in less than 2.5 parts per million in the fat.

Lindquist reports that one spray of .06% lindane applied to hogs resulted in a residue in the fat after one week of 0.66 parts per million. Cattle dipped or sprayed at a concentration of 0.075% show that after two weeks the maximum lindane in the fat was 14.8 parts per million from an emulsion concentrate dip and the minimum was 5.9 parts per million. Sheep dipped in 0.025% lindane showed 4.30 parts per million and goats 3.80 parts per million two weeks after treatment.

These data indicate that dermal applications of lindane to domestic animals for the control of ectoparasites may result in residues occurring in the fat; these residues will not exceed the proposed tolerance requested in this petition when lindane is used according to label directions.

* See references following.

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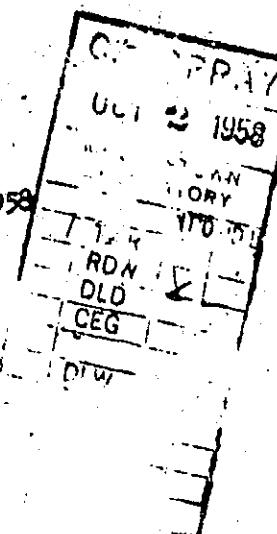
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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
ENTOMOLOGY RESEARCH DIVISION
Beltsville, Maryland

September 29, 1958



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Dr. T. W. Reed
California Spray-Chemical Corporation
P. O. Box 118
Moorestown, New Jersey

Dear Dr. Reed:

Reference is made to your telephone call early last week asking if you could have copies of experimental data with lindane residues in meat and milk. The Kerrville laboratory has prepared Special Report K-54, which summarizes the information obtained up to date. We believe the information will be useful to you.

Very truly yours,

A. W. Lindquist, Chief
Insects Affecting Man and
Animals Research Branch

Enclosure

Lindane Residues in Range Cattle Treated with 0.075% Lindane

Method--To determine residues in range cattle after dermal application, 4 yearling cattle were dipped in 0.075% lindane and 4 were sprayed with 0.075% lindane formulated from a 20% emulsifiable concentrate, and 4 were sprayed with 0.075% lindane formulated from a 25% wettable powder. Four yearling steers were used as controls. All of the 16 cattle were biopsied before treatment, and one-half of each group were biopsied at 1, 2, 3, 4, 6 and 8 weeks post-treatment to obtain olemental fat samples.

Results--Table 2 shows the amount of lindane found.

Residues persisted in range cattle for 6 to 8 weeks. Lindane was present as a residue longer in the animals sprayed with the emulsion formulation.

Three of the 4 cattle dipped in 0.075% emulsified lindane were poisoned, 1 severely. However, these 3 recovered without treatment. None of the sprayed cattle were affected.

Lindane Residues in Sheep and Goats Treated with 0.025% Lindane

Method--Four sheep and 4 goats in short fleece were dipped in 0.025% lindane formulated from 25% wettable powder. Four sheep and 4 goats were used as controls. All the sheep and goats were biopsied before treatment and one-half of each group were biopsied at 2, 4, 6, 8, 10 and 12 weeks post-treatment.

Results--Table 3 shows the amount of lindane found. Residues persisted through the tenth week, but were absent at the twelfth week. No symptoms of poisoning were noted.

CONCLUSIONS

The residues presented in this report, and in the earlier K-28, indicate that lindane is stored in meat and eliminated in milk when animals are fed or sprayed with various concentrations and formulations.

The apparently longer time required for disappearance of residues observed in the new series as against that observed in the studies reported in Special Report K-28 must be considered against the analytical methods employed. The Schachter-Hornstein method employed in the recent studies is several-fold more sensitive than the earlier method, and was capable of detecting the smaller residues for a longer period of time.

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Table 2. Parts Per Million of Lindane in the Fat of Cattle Dipped or Sprayed with 0.075% Concentration of the Insecticide.

Animal Number	Treatment	P.P.M. Lindane in Fat weeks after treatment					
		1	2	3	4	6	8
11	Emulsion Dip	23.0		4.9		1.4	
12	" "	20.6		5.9		1.0	001
13	" "		14.2		1.5		0
14	" "		10.4		2.0		0
21	Emulsion Spray	20.0		3.9		1.4	
22	" "	14.6		3.4		0.4	
23	" "		5.9		1.5		0.5
24	" "		6.4		0.9		0.1
31	Suspension Spray	10.4		1.3		0.0	
32	" "	6.8		1.6		0.3	002
33	" "		6.4		1.7		0
34	" "		9.3		1.1		0

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Table 3. Parts Per Million of Lindane in the Fat of Sheep and Goats
Dipped in 0.025% Concentration of the Insecticide

Animal Number	P.P.M. Lindane in Fat weeks after treatment					
	2	4	6	8	10	12
<u>Goats</u>						
4682	3.20		0.15		0.14	
4684		1.56		0.15		0
4686		1.15		0.22		*
4687	2.14		0.40		0.23	
<u>Sheep</u>						
4688	4.30		0.37		0.27	
4692		1.50		0.12		0
4694		2.00		0.40		0
4695	4.15		0.81		0.27	

* Fat sample not available

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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
ENTOMOLOGY RESEARCH DIVISION
Beltsville, Maryland

March 31, 1959

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MOORESTOWN LABORATORY	
V. C. HOLT	
TWR	
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DD	
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Dr. T. Walter Reed
Assistant Manager Research, East
California Spray-Chemical Corporation
P. O. Box 110
Moorestown, New Jersey

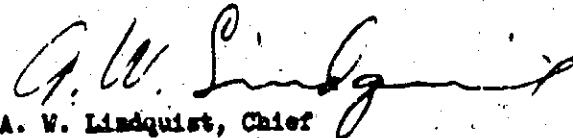
Dear Dr. Reed:

In accordance with your request of March 26, we are enclosing a formal and more detailed report of studies on lindane residues in hogs conducted at Kerrville, Texas. This supplements the summary given in our letter of March 25.

We prepared this report in our office since the detailed data is now available to us. However, as you doubtless know the analytical work was done by Mr. E. V. Claborn, Pesticide Chemicals Research Branch, at Kerrville.

If we can be of further assistance on this matter, let us know.

Very truly yours,



A. V. Lindquist, Chief
Insects Affecting Man and
Animals Research Branch

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Enclosure

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SPECIAL REPORT K-59

LINDANE IN FAT OF HOGS TREATED WITH LINDANE

Results of tests conducted at the Texas
Texas, Laboratory

Studies were conducted to determine the levels of lindane in the fat of hogs at different intervals after treatment. Six hogs each were sprayed with 0.06-percent lindane emulsion and suspension and two were retained as untreated controls. One animal from each group was slaughtered 1, 2, 4 and 6 weeks after treatment and fat samples taken for analysis. Analyses were made by the Schecter-Mornstein method, using the modification employed in analyzing chicken fat. This method gave 98% recovery of lindane added to control fat. The final samples were 50 grams in size in order to increase analytical sensitivity. The parts per million of lindane in the fat at various intervals after treatment are given in the following tabulation:

Animal No.	Type of Spray	Weeks after spraying				005
		1	2	4	6	
3	susp.	0.47	-	-	-	
12	emul.	0.66	-	-	-	
5	susp.	-	0.30	-	-	006
14	emul.	-	0.31	-	-	
4	susp.	-	-	0.14	-	
10	emul.	-	-	0	-	
6	susp.	-	-	-	0	
11	emul.	-	-	-	0	

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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
ENTOMOLOGY RESEARCH BRANCH Division
BELTSVILLE, MARYLAND

April 2nd, 1957

Mr. T. Walter Reed
California Spray Chemical Company
P. O. Box 114
Moorestown, New Jersey

Dear Mr. Reed:

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We have been informed by Dr. A. J. Linquist that you would like to have Mr. H. Claborn's procedure for determining benzene hexachloride in fat. The method employed is as follows:

Weigh a 10 gram sample of fat into a Warin blend and blend for 5 minutes with 15 ml. of distilled chloroform. Add 1 gram anhydrous sodium sulfate and blend for 3 minutes longer. Add 1 gram of filter aid and decant into a 50 ml. Erlenmeyer flask. Wash the blend in beaker and filter paper with about 10 ml. of chloroform.

Distill off the chloroform in approximately 20 ml.; then transfer to a 50 ml. separatory funnel. Add 1 ml. of a 1:1 mixture of sulfuric acid-pumice sulfuric acid. Shake gently and let stand for the sulfonated fatty layer to separate to the top. Drain the chloroform into another 50 ml. separatory funnel. Wash the fatty layer twice with 10 ml. of chloroform and add 1 ml. ether chloroform extract. Discard the funnel containing the fatty layer. Extract the chloroform 3 times with 10 ml. portions of the sulfuric acid mixture. After the last extraction, allow the acid to drain down and then separate as cleanly as possible. Pour the chloroform from the top of the separatory funnel into a clean 50 ml. separatory funnel. Add 10 ml. of 1 per cent sodium bicarbonate to the separatory funnel, stopper, invert and swirl several times with the stopper open. Close the stopcock and shake vigorously releasing the pressure frequently. Let stand for 15 minutes for a reasonably clear separation and then filter the chloroform layer through a 5 cm. plug of cotton packed in a glass crucible holder into a 50 ml. Erlenmeyer flask. Wash the bicarbonate layer with 10 ml. of chloroform and filter into the Erlenmeyer flask.

Distill off the chloroform through a Snyder column to a volume of 10 ml. Transfer the residue to a 125 ml. Erlenmeyer flask, using 5 ml. of acetic acid to make the transfer. Add a glass bead and attach a Snyder column to the flask. Suspend a thermometer into the Snyder column so that the bulb is just below the top of the column. Evaporate the solvent until the temperature reaches the boiling point of acetic acid. Remove the Snyder column and let cool to room temperature.

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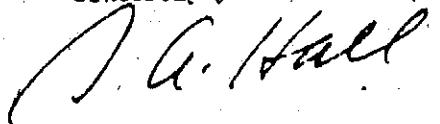
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2--Mr. T. Walter Reed--April 27, 1959

Add three grams of malonic acid and four grams of 40 mesh zinc to the flask. Attach it to the Schechter-Hornstein still and follow the method as described. A sample of control fat should be run with each group of samples analyzed. This sample is used as a blank and subtracted from the test samples. If done this way, the blank will include any contamination of the reagents and any contamination from the air at the time the analysis was carried out.

If you have any questions regarding the procedure, we suggest that you write Mr. Claborn directly. His address is, Mr. R. V. Claborn, Entomology Research Division, P. O. Box 232, Kerrville, Texas.

Sincerely yours,



S. A. Hall, Chief
Pesticide Chemicals Research Branch

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